

## WHAT IS CLAIMED IS:

1. A device comprising a substrate having a composite membrane coated thereon,  
the composite membrane being fabricated from a composition, the composition comprising,  
based on the final weight of the composition:

a water-insoluble polymer, in an amount of from about 3 % to about 50 %; and

a water-insoluble wax, in an amount of from about 0.001 % to about 20 %;

in a solvent.

2. The device of claim 1, wherein the substrate comprises a starch-based polymer  
product.

3. The device of claim 1, wherein the substrate comprises a non-woven fabric.

4. The device of claim 1, wherein the composition further comprises an  
ingredient selected from the group consisting of stearic acid, palmitic acid, and stearyl  
alcohol, in an amount of from about 0.01 % to about 10 %.

5. The composition of claim 1, wherein the composite membrane is fabricated  
by phase inversion technique.

6. The composition of claim 1, wherein the water-insoluble polymer is in an  
amount of from about 3 % to about 50 %.

7. The composition of claim 1, wherein the water-insoluble wax is in an amount of from about 0.001 % to about 20 %.

8. The composition of claim 1, wherein the water-insoluble polymer is selected from the group consisting of cellulose acetate butyrate, cellulose acetate propionate, cellulose acetate and ethylcellulose.

9. The composition of claim 1, wherein the water-insoluble polymer is selected from the group consisting of polysulfone and polyacrylonitrile-co-butadiene-co-styrene.

10. The composition of claim 1, wherein the water-insoluble wax is selected from the group consisting of beeswax, carnauba wax and candelilla wax.

11. The composition of claim 1, wherein the water-insoluble wax is selected from the group consisting of Callista 158, Shellwax 200 and Shellwax 300.

12. The composition of claim 1, wherein the solvent is selected from the group consisting of dimethylformamide, dimethylacetamide and ethanol.

13. The composition of claim 1, wherein the solvent is selected from the group consisting of acetone, butanone, chloroform, benzene, toluene and acetic acid.

14. The composition of claim 1, wherein the solvent is phosphoric acid.

15. A composition for fabricating a composite membrane used for coating a substrate, the composition comprising, based on the final weight of the composition:

a water-insoluble polymer, in an amount of from about 5 % to about 30 %;

and

a water-insoluble wax, in an amount of from about 0.1 % to about 10 %

having a melting point of from about 45°C to about 120°C; and

in a solvent.

16. The composition of claim 15, wherein the composition further comprises an ingredient selected from the group consisting of stearic acid, palmitic acid and stearyl alcohol, in an amount of from about 0.05 % to about 5 %.

17. The composition of claim 15, wherein the composite membrane is fabricated by phase inversion technique.

18. The composition of claim 15, wherein the water-insoluble polymer is in an amount of from about 8 % to about 25 %.

19. The composition of claim 15, wherein the water-insoluble wax is in an amount of from about 0.2 % to about 5 % having a melting point of from about 50°C to about 80°C.

20. The composition of claim 15, wherein the water-insoluble polymer is selected from the group consisting of cellulose acetate butyrate, cellulose acetate propionate, cellulose acetate and ethylcellulose.

21. The composition of claim 15, wherein the water-insoluble polymer is selected from the group consisting of polysulfone and polyacrylonitrile-co-butadiene-co-styrene.

22. The composition of claim 15, wherein the water-insoluble wax is selected from the group consisting of beeswax, carnauba wax and cadelilla wax.

23. The composition of claim 15, wherein the water-insoluble wax is selected from the group consisting of Callista 158, Shellwax 200 and Shellwax 300.

24. The composition of claim 15, wherein the solvent is selected from the group consisting of dimethylformamide, dimethylacetamide and ethanol.

25. The composition of claim 15, wherein the solvent is selected from the group consisting of acetone, butanone, chloroform, benzene, toluene and acetic acid.

26. The composition of claim 15, wherein the solvent is phosphoric acid.

27. A method for fabricating a composite membrane on a surface of a substrate,  
comprising:

dissolving a mixture of a water-insoluble polymer, a water-insoluble polymer  
in an organic solvent to give a solution;

removing air bubbles from the solution to give a final solution;

casting the final solution onto the surface of the substrate; and

curing the surface of the substrate having the final solution thereon to give a  
composite membrane on the surface of the substrate.

28. The method of claim 27, wherein the substrate is selected from the group  
consisting of a starch based food package material, a protein based food package materials,  
a natural fabric, a synthetic fabric, and a paper product.

29. A composition for fabricating a composite membrane used for coating a  
substrate, the composition comprising, based on the final weight of the composition:

from about 3 % to about 7 % of beeswax;

from about 10 % to about 14 % of cellulose acetate butyrate;

from about 0.6 % to about 1 % of 1-octadecanol; and

from about 80 % to about 84 % butanone.

30. The composition of claim 29, wherein the substrate is selected from the group consisting of a starch based food package material, a protein based food package materials, a natural fabric, a synthetic fabric, and a paper product.

31. A method for fabricating a composite membrane on a surface of a substrate, comprising, based on the final weight of the composition:

mixing from about 1 % to about 5 % of beeswax, from about 7 % to about 11 % of cellulose acetate butyrate, and from about 86 % to about 90 % of a 1 to 4 mixture of acetone and butanone to give a composition;

heating the composition to a temperature of from about 60° C to about 70 °C for a period of from about 10 minutes to about 20 minutes to obtain a uniform solution;

keeping the uniform solution at a temperature of from about 60° C to about 70° C for a period of from about 1 to about 5 hours to give a solution relatively free of air bubbles;

applying the solution relatively free of air bubbles on the surface of the substrate to give a pre-coated substrate;

heating the pre-coated substrate to a temperature of from about 60° C to about 75° C for a period of from about 1 minute to about 10 minutes to give a heated substrate; and

cooling the heated substrate to give a coated substrate.

32. The method of claim 31, further comprising heating the coated substrate to a temperature of from about 60° C to about 75° C for a period of from about 1 minute to about 7 minutes.

33. The method of claim 31, wherein the substrate is selected from a group  
2 consisting of a starch based food package material, a protein based food package materials,  
3 a natural fabric, a synthetic fabric, and a paper product.

34. A method for controlling transmembrane transport of a liquid or a gas through  
2 a composite membrane, the composite membrane being fabricated from a composition, the  
3 composition comprising, based on the final weight of the composition, a water-insoluble  
4 polymer, in an amount of from about 3 % to about 50 %, and a water-insoluble wax, in an  
5 amount of from about 0.001 % to about 20 %, dissolved in a solvent, the method comprising:  
6 adjusting the ratio of the water-insoluble wax to the water-insoluble polymer  
7 in the composition.

35. The method of claim 34, wherein the composite membrane is being coated on  
2 a substrate.

36. The method of claim 35, wherein the substrate is selected from the group  
2 consisting of a starch based food package material, a protein based food package materials,  
3 a natural fabric, a synthetic fabric, and a paper product

37. The method of claim 35, wherein the liquid comprises water.

38. The method of claim 35, wherein the gas is selected from the group consisting

2 of water vapor, nitrogen, and oxygen.